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Pogledi / Views

THE REALIZATION OF GENOME IN THE NOTIONS OF PHYSICS OF THE ALIVE*

REALIZACIJA GENOMA U KONCEPTIMA FIZIKE ŽIVOG*

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Ključne reči
Živo, koherencija, genom, kvantno-mehanička organizacija Prirode, kvantna medicina, mm-opseg elektromagnetnih talasa, drevna kineska medicina, Bog.

Abstract

Quantum Physics of the Alive is based on the definition of the Alive (in its distinction from the Dead-inanimate) as a fourth level of quantum organization of Nature (after nuclear, atomic, and molecular levels). Self-consistent potential of each living object is formed in accordance with genome as a laser of mm-range wavelength. Such a notion concerning the Alive, grounded on theoretical considerations, clinical material and the direct experiments, allows us to cast a fresh glance on the fundamental problems of biology and not only on them…

INTRODUCTION

The notions of Physics of the Alive permit us to abandon primitive point of view on the realization of genome, which sounds as seeking "the genes responsible for so, so and so". It is absurd, nonsense. A gene is combination of DNA molecules and even being very big and complicated it cannot "respond" for peculiarities of morphological structure of human body or the features of man's character as well.

The hereditary information is only preserved in genome, but is realized by means of functioning of the coherent eigenfield of organism (electromagnetic framework, electromagnetic model, God's defence).

Quantum medicine rests upon the belief that understanding of the essence of the alive in its distinction from the non-alive must serve as a prerequisite for medical treatment or better say "rendering aid to people".

Just this belief was introduced into quantum medicine by its theoretical basis, i.e. Physics of the Alive – a new trend of natural science which has turned biology and medicine from empirical into fundamental science. It is expedient to remind here that nowadays there exists a strict definition of the notion of fundamentality in natural sciences. They are the sciences in which the objects of investigation have discrete spectra of characteristic eigenfrequencies. Before the discovery of "manifestation of characteristic eigenfrequencies of a human organism" [1], that is, before the time when ideas of physics of the alive have been formed, there were three such sciences: nuclear, atomic, and molecular physics.

I believe, Weisskopf [2] was the first one who has drawn attention of the scientific community to the fact that just the principles of quantum mechanics, i.e. the principles of identity and discreteness, and also existence of characteristic eigenfrequencies related to them, ensure diverse stability of the world at nuclear, atomic, and molecular levels of the matter self-organization. Weisskopf introduced the notion about three stages of quantum organization of nature or, as it is often said, three steps of Weisskopf`s Quantum Ladder.

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Guided by the well-known facts of the levels overlap in the energy spectra of manymolecular structures (due to the screening mechanism and close connections in solid bodies and liquids), Weisskopf has guessed that the third molecular level was the last level of quantum organization of nature, and molecular physics was the third and the last fundamental science, respectively.

At the same time, in nature, besides nuclei, atoms, and molecules, there is also at least one more class of objects which are characterized by diversified differential stability as well. These are the living beings. Life is not a substance that constantly varies its form and structure as "the ocean of life" in the well-known film "Solaris". The earth, water, and air are inhabited by quite discrete representatives of flora and fauna. There are their species, genera, particular individuals. Their similarities and differences are stable in time: at any continent we distinguish cats, dogs, sparrows.

We, I mean the humans, are also much alike to each other, but each of us has individual features of appearance which remain unchanged so that we recognize ourselves (in a mirror) and our acquaintances when we see them. Thus there arises a temptation to explain diverse differential stability of the living by the same principles of quantum mechanics, i.e. the principles of identity and discreteness and, accordingly, to consider the living systems as the whole quantum-mechanical entities [1].

2.Physics of the Alive and Macroscopic Quantum Effects in Biophysics

Microscopic dimensions do not serve as the necessary condition for application of quantum mechanics. The presence of macroscopic quantum effects testifies to this fact: superfluidity, superconductivity, Josephson effect. Actually the necessary condition for application of quantum mechanics is existence of the entire self-consistent potential in the system. The self-consistent potentials of the same type determine the existence of the objects which form the respective steps of quantum ladders.

In other words, *the necessary condition* for formation of the whole macroscopic quantum-mechanical entity is existence of the efficient long-range acting forces within a restricted energetic (frequency) range that would have created the coherent multimode fields of laser type in each entity.

Additionally, *the sufficient condition* for existence of macroscopic quantum-mechanical entity at its own step of Weisskopf`s quantum ladder is the availability of the mechanism of self-support of such types of fields, and of characteristic spectral composition defined by active centers, but certainly on condition of positive energy of their joining.

Such conditions are realized in the living systems.

Really, as shown by Fröhlich [3], the frequencies of eigenoscillations of cytoplasmic membranes of all living systems must lie within ($10^{10} \div 10^{11}$) Hz range. It means that this is the range where we can observe the effects of resonance amplification of selective modes related with the reaction to changes of spatial genome structures in the process of DNA replication, RNA transcription, protein translation. In this context, of great importance is the existence of the so-called proton transport described by Mitchell [4], which consumes a considerable portion of metabolic energy of cells and which constantly maintains the great tension of electric field on cytoplasmic membranes (approximately 10^5 V/cm). Just this fact may (potentially) turn the cells (their membranes, to be more exact) into the active centers of formation and maintaining of coherent eigenfield of a body in millimeter range of electromagnetic waves.

However, as water prevails in chemical composition of human organism and this water intensively absorbs the mm-range electromagnetic radiation, so the necessary condition of generation of coherent modes is not sufficient as yet, though the favorable conditions exist ($h\nu << kT$). In this case the relation of probability of induced transitions to spontaneous ones is much higher than unity ($P_{ind}/P_{spon} \sim kT/h\nu >> 1$) [5].

That is why the answer to the question whether the real situation in living organisms lies beyond the threshold of non-equilibrium phase transition to coherent state, should be obtained by way of observation and research.

Such observations exist.

Several thousand years BC the Chinese men of wisdom, who have laid the foundation of what we call now the Ancient Chinese Medicine or acupuncture, were guided by the ideas that the internal organs of a man are intersected by the lines, the so-called meridians (channels), whose external tracks are situated at the surface of a body. There are 26 channels, twelve paired and two unpaired. The majority of biologically active points (BAP) or acupuncture points are situated just over them. These points are used for sticking the needles into them according to the needling technologies (by way of example see [6]).

Skeptical attitude of the official West medicine towards the Ancient Chinese medicine in spite of undeniable achievements of the latter is related to the ideas concerned with the existence of a meridian network. The problem resides in the fact that channels are not observed at anatomic-morphological level, and the West medicine based on the so-called chemical paradigm adheres to the visualization principle claiming

[1] We must do justice to Weisskopf: drawing schematically his quantum ladder, he has also drawn the fourth step with discrete energy levels – the level of life – as early as in 1972… with no comments, just as a foresight of a genius.

that only something that can be seen directly by an eye or with the help of a microscope does actually exist and can be an object of scientific research in an organism. The origin of so primitive, at first sight, ideas can be understood if we consider the history of development of the West science in general, and medicine and biology in particular. The modern West medicine had been forming in the middle ages staying under the pressure of religious dogmatism, with canons defended by the Inquisition in the struggle against heretics. The meticulous medical men were in a constant danger to be enlisted among the heretics. The bravest of them displayed their protest by spontaneous formation of primitive materialistic world outlook. In the struggle against official religious scholasticism they shifted to positions of the extreme atheism, denying the very existence of God with the argument that "nobody saw him".

In my opinion, just this argument underlies the principle of visualization which has been considered the criterion of science in medicine and biology for many centuries.

During the same centuries, the fundamental science studying the non-living nature expanded essentially our ideas about it, in particular, due to the field concepts. And nowadays, even at domestic level nobody is surprised at the possibility to tune the radio or TV sets to a great number of stations or the possibility to chat by mobile telephone, though it is impossible in all these cases to "view" by an eye the carriers of information.

As to the scientific notions, the mankind enters the third millennium with strong recognition of the idea that in the worldview a field and a substance are represented at the fundamental level as equal in rights.

It is worth noting that for several centuries, i.e. long before formation of concepts of quantum electrodynamics and physical vacuum, physics (being non-oppressed by ideological burden in contrast to medicine and biology) has been guided by global principles which reflect the material unity of the world due to existence of the effective long-range action and which underlie the laws of modern physics. I mean the principle of the least action (Maupertuis), the principle of the shortest optical path (Fermat), the least losses principle (for current), the principle of a system transfer to the lowest potential energy, etc.

It is difficult to imagine that not a single person in medicine and biology knew nothing about it. Then a question arises: why is it considered the axiom that for a child birth nothing is needed apart from the union in vitro of a spermatozoid and an ovum, for example? Or else, that it is necessary to look for the genes which are "responsible" for something [7]?

I am convinced that *the cause of such views is macroscopic dimensions of independently functioning living objects.*

Really, the modern West civilization was based on atomistic ideas of Democritus according to which cognition of nature must proceed by way of division of the macroscopic objects surrounding us into smaller parts, up to the indivisible ones (atoms) and their study would give an answer to all questions. And though today our atoms are not the smallest objects of the microworld, the atomistic idea itself proved to be very fruitful and the achievements of the West civilization testify to this statement.

It should be recognized that the physicists who made revolution in natural science in the first decades of the last century have also contributed to consolidation of false idea that only in the microworld there occur the events having the fundamental importance.

As it is known, the pretext for the above-mentioned revolution was impossibility to explain certain phenomena of the microworld by the laws of classical physics, and its consequence was the origin of quantum mechanics, the principles of which (identity and discreteness), as was noticed earlier, ensure the existence of three steps of Weisskopfžs quantum ladder and, respectively, three fundamental sciences: nuclear, atomic, and molecular physics. It means that many-molecular objects having no discrete energy levels cannot carry the fundamental information.

In this way, beyond the interest of fundamental science (with its notions of field, virtual particles and photons, quantum transitions and metastable states, volume and length of coherence, etc.) there was left not only the whole macroscopic physics but the entire living world. It means that according to the standard notions the integral living beings (the humans inclusive) must be studied within the scope of classical physics solely, painted with chemical reactions, and the phenomenon of life itself is a singularity which stays outside the science.

Thus, we are the witnesses of the absurd situation: all people have no doubts that the living differs from the dead, life from death, but dozens of biological and medical sciences, the task of which must have been the support of life in its opposition to death, were not imbued with the phenomenon of life studying only its fragmentary signs.

3. Physics of the Alive and Quantum Medicine

Physics of the alive and quantum medicine have radically changed the situation. It became clear that an organism displayed all signs of the whole quantum-mechanical system, the ground state of which is health and metastable state – disease.

And really so, transition from the metastable to the ground state, similarly to the preceding steps of the quantum ladder, is realized in a body during medical

treatment by mm-range electromagnetic quanta, the energy of which stimulates transition of the system from metastable state to such an excited state from where a cascade transition into the ground state (health) goes by the selected rules with the higher probability than the return to the metastable state (Fig. 1a,b).

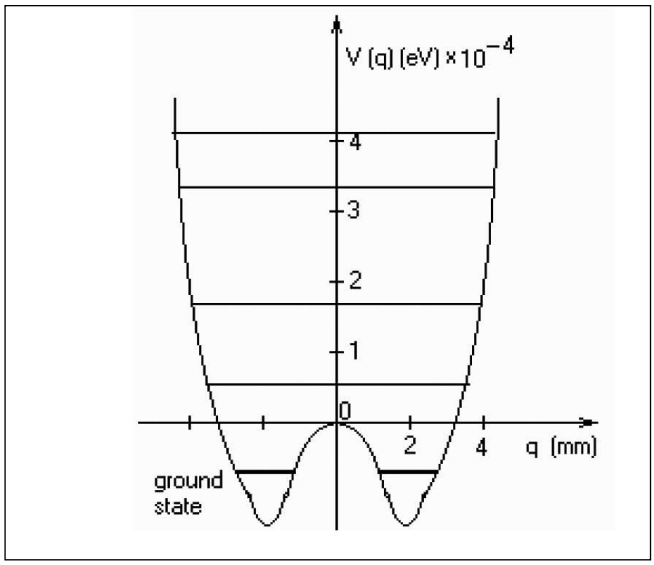

Figure 1a. Organism's ground state (health). Landau-Haken potential $V(q)=kq^2/2+k_1q^4/4$ ($k<0$, $k_1>0$).

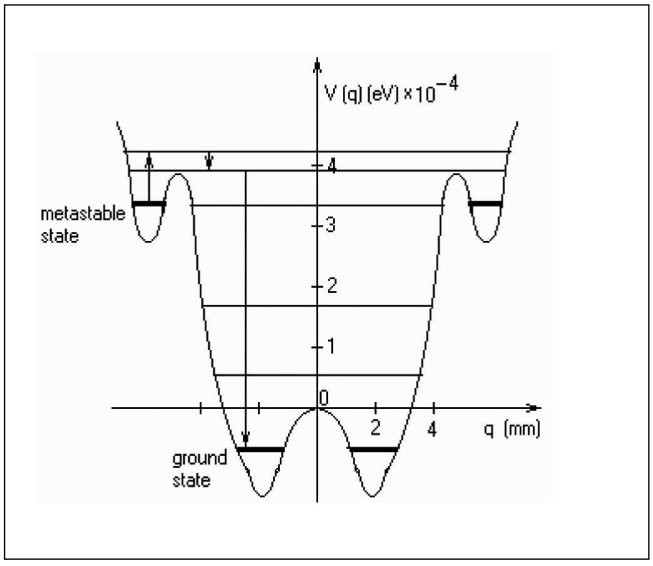

Figure 1b. Metastable state (disease) of the organism. Deformed Landau-Haken potential. The way out of metastable state (treatment) is shown with usage of MRT.

As is generally known [7, 8], the basic technology of quantum medicine is microwave resonance therapy (MRT) which makes use of the flows with spectral density ($10^{-21}\div10^{-20}$) W/Hz cm^2 in medical practice. This density corresponds to quite a few mm-range quanta.

In this way, the physician of quantum medicine working with extremely low flows of the mm-range electromagnetic radiation tries to do his best to implement the conditions depicted in Fig. 1b. At one of these "resonance" or therapeutic frequencies, the electromagnetic framework of human returns to the ground state and as far as the framework is self-consistent with anatomic-morphological structure of a body, so such an approach induces the process of adjustment of the anatomic-morphological structure to the restored framework, i.e. the process of cure starts. Taking into account that the organs and other morphological structures of a body cannot get reconstructed in a moment, there remains probability that with the lapse of time (several hours) the organism will return to metastable state though deformation of potential decreases and the state approaches to the one depicted in Fig. 1a. It should be noted that according to variation of the potential form, therapeutic frequencies may be changed in the following days of treatment, so the resonance "tuning" is necessary at each session. It is easy to notice that in a healthy organism there are no therapeutic frequencies and this fully corresponds to the practice of the MRT application.

Let us return to the question about formation of the coherent field of a body, existence of which, in accordance with genome, allows to perceive an organism as a whole quantum-mechanical entity.

The investigations showed that the maximal MRT efficiency is observed in those cases when the action of the source of the mm-range electromagnetic radiation is directed to biologically active points (BAT) of a body which correspond to acupuncture points, and are located mostly, as it was noticed above, over the external tracks of the channels painted on sculptural images of a man by Chinese men of wisdom more than 5000 years ago.

I have already written that trajectories of the meridians do not have morphological peculiarities, i.e. they cannot be seen by eyes, that is why the West medicine denies their real existence in the belief that their only destination may be to help the physicians-needling therapists to find BAP on a human body.

We managed "to see" the channels [9].

They actually exist and really connect the fingertips of hands and legs with the internal organs, but not within a visible range seen by the eyes but just within mm-range of electromagnetic framework, coherent eigenfield of an organism, due to which there exist efficient long-range acting forces of an organism ensuring its quantum-mechanical entirety.

According to the ideas of physics of the alive, formation of a meridian system of a body begins during 14th week of an embryo development. At this time cartilages harden and are turned into the bones, this is accompanied by spontaneous breaking of symmetry at fundamental level: the running waves are reflected from the nails thus forming dynamic interferential picture such as standing waves. This can be observed as a papilar picture at the fingertips of one's hands and legs

[10]. The meridian system in the form of dynamic waveguides is formed due to reflection of the running waves from the bones, on the one hand, and, on the other hand, from the inside skin surface in the area of BAPs, positions of which on the surface of skin are defined with the places of falling of the running waves at angle of the complete internal reflection [10]. Stability of the meridian system during functioning of the joints is ensured by the obligatory presence of BAP in the center of flexions of each joint of the limbs.

The measurements carried out with the help of specially designed radiometric system at the level of the inherent noises ~ $5 \cdot 10^{-23}$ W/Hz·cm^2 [8, 11] gave the possibility to obtain the important characteristics of the channels and BAPs:

1. The channels have diameter (3÷5) mm, at least at the spots of their approaching the surface in acupuncture points;

2. The refraction index inside the channel is the same as in atmosphere, that is n = 1, but not 5÷6 as in the body outside the channel areas;

3. In case of functional disorders related to the concrete channel, at density of the external flux within the range of ($10^{-21} \div 10^{-20}$) W/Hz·cm^2, the respective acupuncture point completely absorbs this radiation, that is, the black-body mode is realized with the absence of reflection;

4. With the current density increasing up to 10^{-19} W/Hz·cm^2 and more, the situation changes in a triggering way – BAP completely reflects the external mm-radiation (it can be suggested that just in this way life on the planet is preserved under condition of technological electromagnetic pollution of the environment within the life range which is, in natural conditions, devoid of the sun effects due to the intensive absorption of mm-range electromagnetic waves by the atmosphere).

The above-stated properties of the channels actually allows to consider them as dynamic waveguides along which light-excitons are running ensuring the coherence of the entire electromagnetic framework of a body [12]. Such an interpretation gives good reason to apply the electrodynamics laws in the attempts to understand the peculiarities of the metric scale used in ancient Chinese medicine.

It is known that the distance between acupuncture points along the external tracks of the channels in the ancient Chinese medicine is measured in the specific length unity – *cun*. One *cun* length is different with different people, because it is defined by anatomic characteristics of a particular organism. In monographs concerning acupuncture [6], to determine the *cun* length, as a rule, it is recommended to give due regard for certain anatomic peculiarities of a hand. Generally speaking, one *cun* is approximately the width of a thumb in the plane of a nail in a joint, that is, this value for the grown-up person with common anatomic proportions constitutes approximately 2.5 cm.

Let us turn our attention to the mechanism of formation of the field inside the channel, considering the

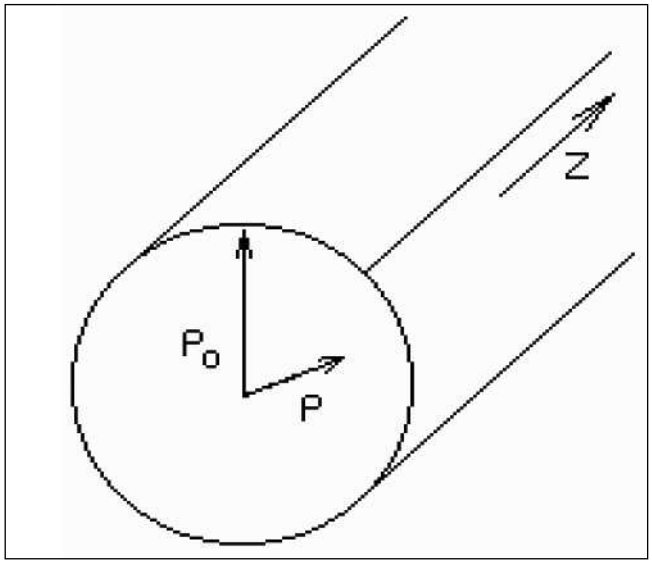

Figure 2. Scheme of the channel as dynamic waveguide $P_0 = d/2$.

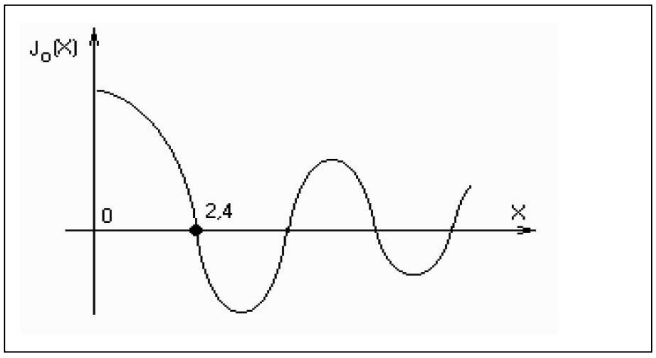

Figure 3. Cylindrical Bessel function of the first degree of zero order.

latter as dynamic cylindrical waveguide with diameters d = (3÷5) mm and refraction index equal to unity (n = 1), i.e. the same as in the air (Fig. 2).

In the process of formation of the standing wave along the waveguide (Z), at first the running wave is in motion. Axially symmetric problem is solved in cylindrical coordinates (ρ, z). Write down the wave equation:

$$\nabla^2 E - 1/c^2 \delta^2 E/\delta t^2 = 0. \qquad (1)$$

Its solution will be found as:

$$E = E_0 j_0 (k_\rho \rho) \exp (j(\omega t - k_z z)), \qquad (2)$$

where k_ρ and k_z are components of a wave vector in channel-waveguide along radius R and channel waveguide z, respectively, and $j_0 (k_\rho \rho)$ is cylindrical Bessel function of the first degree of zero order (Fig. 3). Let us use the first root approximation: $k_\rho \rho_0 = 2.4$.

Taking into account that Bessel function is eigenfunction of Laplace equation, after substitution of (2) into (1) we obtain:

$$-k_\rho^2 - k_z^2 + \omega^2/c^2 = 0; \quad \text{.....(3)}$$

$$k_z = \sqrt{(\omega/c)^2 - k_\rho^2}. \quad (4)$$

After substitution $k_\rho \cdot \rho_0 = 2.4$ into (4) we obtain:

$$k_z = \sqrt{(\omega/c)^2 - (2.4/\rho_0)^2}. \quad \text{.....(5)}$$

By definition: $k_z = 2\pi/\lambda_z$, where λ_z is wave length in a waveguide; in addition, by taking $\rho_0 = d/2$, from formula (5) we obtain:

$$\lambda_z = \lambda_o/[1-(\lambda_o/1.3\cdot d)^2]^{1/2} \quad (6)$$

where λ_o is wave length in atmosphere and $\omega/c = k = 2\pi/\lambda_o$ is wave vector k in atmosphere; for $\lambda_o = (5\div6)$ mm and d = (3÷5) mm, from formula (6) it follows

$\lambda_z = (5\div6)$ cm.

In a standing wave formation, the distance between the maxima (and minima) equals the half of the wave length, i.e. (2.5÷3) cm.

Certainly, the values of λ_z given by formula (6) are very sensitive to the relation λ_o/d. But formation and support of the proper meridian in a body, in accordance with genome, represents a self-consistent process; when depending on the state of an organism, the meridian diameter d can "breathe" by fractions of millimeter, preserving constant distance in *cun* between atomic-morphological structures; if we take into consideration the internal tracks of the channel, then, perhaps, it controls also the structure and form of the internal organs.

4. Biological Implications

Such approach is in accordance with our perceiving that all living beings, due to existence of coherent eigenfields of everyone, are macroscopic quantum-mechanical entities which obey the laws of quantum mechanics. In particular, not only blood [13] but every liquid in a human organism ought to move as superfluid ones (for example, not touching the walls of vessels). Besides, every organism ought to be a superconductor [14] of the second type, stability of which in the environment realizes due to "breathing" of normal threads. Such role here renders meridians (dynamic waveguides).

In this way, besides anatomic-morphological structures of a body which we can see by eyes, there exists (actually exists, because it can be measured [11]) something that it is impossible to see – the so-called electromagnetic framework of a man or, to be more exact in scientific sense, the coherent eigenfield of a human in mm-range of electromagnetic waves. This field is formed owing to electromagnetic activity of each cell of a body, but having been formed, it coordinates, synchronizes, and directs the functioning of each organ, each structure of a body in a mother's womb and after the child birth during the whole life. Taking into account that genome of each somatic cell of a particular organism is the same, so just by way of formation and functioning of this coherent field, this electromagnetic framework, the genome is not realized, as it was believed earlier, exclusively by way of chemical transformations within the cells (by cell division and proteins generation).

Apart from maintaining the growth of an organism, these processes (DNA replication, RNA transcription, protein translation, etc.) are also realized for the vital requirements, i.e. for the case when coherent field of an organism does not match its anatomic-morphological structure. This happens in two cases.

The first case is related to the situation when the external factors (blows, falls, injury, etc.) break morphological structure of an organism and form mismatch between electromagnetic framework and its realization in a particular spot (for example, in a wound).

The second case is realized in the situation when under some extremely strong external stimuli, the coherent field gets deformed. It no longer corresponds to the genome and gradually imposes its deformation to the anatomic-morphological structure which cannot be removed by the methods of the medicament therapy. In this way chronic diseases arise.

The stated approach gives us the new attitude to solution of many well-known problems of biology. By way of example, let us consider two of them: the "garbage genes" problem and the wounds healing problem.

Existence of nearly 98% genes as if not participating in the hereditary information transfer is considered as one of the most painful paradoxes at the modern stage of development of biology. This problem does not exist for Physics of the Alive, since it considers that all 100% of the genome genes participate in formation of coherent eigenfield of a body in mm-range of electromagnetic waves (the electromagnetic framework). In conformity with the quantum mechanics laws, the potential wells of Landau-Haken type along the meridians, which at this approach are considered as Poincare`s limit cycle, are filled with the energy levels. Transitions between these levels, in accordance with selection rules, form the spectrum of characteristic eigenfrequencies of a particular organism. The genome hereditary information is retranslated just in this spectrum. This spectrum is universal passport of an organism and, as mentioned before, it is visualized in the form of papilar patterns on the soft flesh of fingers of hands and legs, which are (proceeding from positions of physics of the alive) nothing else but the dynamic interferential images (on concave screens) of the direct and reflected from the nails eigenwaves of an organism [10].

In a healthy organism whose quantum system is devoid of metastable states, the electromagnetic framework is self-consistent with anatomic-morphological

structure. For maintaining of such a state, biochemical mechanisms of the cell division and protein generation must switch on from time to time and in the definite spots of an organism, namely, in those where between the structure of a coherent field and its morphological realizations mismatch begins to exceed the definite threshold. This happens in the situations when even in natural conditions, life-time of certain cells or tissues is restricted, for example, for epithelium tissues or erythrocytes. Let us remind that life-time of the human erythrocytes constitutes 120 days and nearly 2.5 mln of them dies and is generated again in a spleen and liver each second. For constant maintenance of these processes, the coherent field of an organism actually utilizes only very insignificant portion of the genome.

Quite a different picture must be realized during the embryo development (embryogenesis) and in postnatal period (morphogenesis), in case of the damages of electromagnetic framework or injuries of anatomic-morphological structure of an organism. In all these situations, much greater part of the genome, up to one hundred percent[2], proves to be effectively actuated depending on the specific conditions in the chain "genome – coherent eigenfield – anatomic-morphological structure".

By way of example, consider a prosaic situation which can take place with everyone. You have cut a finger. Why the wound is healing? Why just that kind of tissue is formed which is required and in the quantity that is required and in such a way that if the cut is not very deep, then in some days even trace of it will disappear?

Despite the seeming simplicity of these questions, the answers on them are related with solution of one of the fundamental problems of biology – the problem of morphogenesis, form creativity and differentiation of tissues. Within the boundaries of classical biology and linear physics, there were no answers to these questions, moreover it was unclear how to get closer to their solution.

By the end of past century when the revolution in natural sciences has taken place, the situation changed. It was due to recognition of the importance of non-linearity and openness in formation of stable self-organized systems far from thermodynamic equilibrium. That is, the conditions of local entropy decrease became clear. Implementation of these ideas resulted in origin of two new sciences: synergetics and theory of dissipative structures.

Undoubtedly, Belintsev [15] was the one who applied the methods of self-organization theory for development of the foundations of biological formativity and solution of the related problems in the most professional and fruitful way. Unfortunately, he remained within a chemical paradigm; he believed that the carrier of long-range forces were the so-called morphogenes, chemical substances formed by some elements of future organism during form creativity and absorbed by the others. This approach has not allowed him to make a step towards understanding of the living as the whole quantum-mechanical entity which is situated at the fourth step of a quantum ladder when self-consistent potential is formed in accordance with genome as coherent eigenfield of a body within millimeter range of electromagnetic waves. Just this definition lies at the basis of physics of the alive.

From these positions the phenomenon of healing of the injured (cut) finger finds its *schematic explanation.* In the wound area a certain number of cells were destroyed, but electromagnetic framework – coherent eigenfield of an organism remained, since it was created by billions and billions cells of an organism carrying the same hereditary information. The mismatch between the structure of a coherent field of a body (realized owing to the spectrum of its characteristic eigenfrequencies and which describes by the universal electromagnetic language all the details of body's structure and its functioning) and the deformed morphology at the injured spot initiates the standard and well-known mechanisms of cells' division and generation of the particular proteins just at the injured spot (DNA replication, RNA transcription, protein translation). These processes must proceed under control of the electromagnetic framework until the mismatch between a framework (which gives what is necessary) and morphological structure at the injured spot becomes less than sensitivity threshold of the system realizing this mechanism of communication.

The expression "schematic explanation" was underlined earlier because I do not actually have a claim on description of the details of formative mechanisms. It is just a scheme as yet but the real scheme based on the modern scientific ideas [3,9-27], medical-biological and physical measurements [28-33], the impressive clinical results [34-43] obtained during 20 years in the process of curing of hundreds of thousands of patients in many countries of the world.

So I hope that the above-stated, the new in principle, ideas about the nature of life which form physics of the alive and quantum medicine, will enable biology (and medicine as well) to overcome the prejudice, the historical roots of which I described in this paper and which essentially hamper the development of the

[2] The real situation is much more complex. I understood this, preparing for publication the unpublished proceedings of my father, Prof. Sit'ko Panteleimon Onufrievich, Doctor of biological sciences, genetics scientist, on occasion of his 100 years birthday anniversary (1906). To all appearances, he was the first to pay attention to so-called "polygenomity of heredity", i.e. that there should be inherited not only the genome connected to DNA, but also division mechanisms (among them occurrence of division spindle, ensuring divergence of chromosomes in mitosis and meiosis), formation and functioning of mitochondria as energetic pool of cells, etc. So the development of exclusively chromosome heredity theory is of rather fragmentary, initial character.

relevant sciences. I hope as well that planning of the further research in biology and medicine will be carried out with due regard for the stated above.

5. *Medical Implications*

We discussed the process of healing i.e. self-cure. But what can be done if the disease becomes chronic and is not cured by itself, or with the efforts of surgery and the medicament therapy. It was mentioned that this corresponds to the situation of disorder (deformation) of the electromagnetic framework itself. Quantum medicine (and, respectively, its basic technology – microwave resonance therapy – MRT) are aimed at restoration of electromagnetic framework of a human. The patented technologies of diagnostics and quantum medicine therapy [44] allow for determining of disorders in these or that channels and for eliminating them.

As a rule, the course of treatment consists of 10÷12 sessions, 45÷70 minutes each. During this time the metastable state of the framework decreases so much that not a single self-organization level can be formed here. In other words, the framework of an organism is constantly in the ground potential well.

The express-diagnostics methods [31,32,35,42] used by us, permit us to monitor the dynamics of treatment and to make the adequate corrections, if necessary.

The most impressive (even fantastic from the point of view of the West medicament therapy) results are observed at the first session. At the moment of resonance which ensures returning of quantum system from metastable state to the ground state, the patient feels that his pain disappears practically instantly, the feeling of lightness, of imponderability, complete bliss arises, in the closed eyes there appear dark blue, light blue, violet, green colours or bright white radiance.

Let me remind that MRT is monotherepy, i.e. its application envisages the complete rejection of any drugs or medicaments several days before the first session. Thus our patients pass to the new, non-chemical medicine.

It is important to underline that the procedures of BAP stimulation are realized by the powers carrying a few quanta (10^{-21}÷10^{-20}) W/Hz·cm^2. The points of action are located, as a rule, in a distal way, on fingertips of hands and legs, sometimes in other places. To apply stimuli directly to the wound or painful area is prohibited categorically. The first and very important MRT rule is formulated as: never exert influence upon a focus of a disease.

It was found that subjective sensations of a patient are more reliable and efficient method of "tuning" to resonance. The point is that human sensations have been formed as a result of action of millions of self-consistent structures of an organism, which ensure its functioning. The most reliable value herewith is the painful sensation. Adjustment to resonance aimed at removing the pain proved to be the important and obligatory prerequisite of successful treatment. The modern quantum medicine technologies (Sit'ko–MRT) ensure practically complete removing of pain even in case of the grave oncological patients when anesthetic drugs fail to help.

Unfortunately, this does not mean that in all cases of rendering help to very grave and "incurable" patients we can save them from their disease and also from the consequences of their treatment by well-recognized methods of the West medicine: surgical operations, chemical therapy, and irradiation. But almost always we manage to improve their quality of life: to prolong it maximally without taking drugs and other chemical preparations; to remove the pain allowing the patient to keep his dignity and to associate with his relatives and fellow men up to the last day. In this way, the objective reasons for discussion about euthanasia disappear.

As the treatment proceeds, the depth of metastable well of self-consistent potential of an organism decreases as well as the probability of residence of an organism in this well, and the averaged sensations during the session become less acute. In case of the complex potential restoration which corresponds to the healthy organism criterion according to our ideas, the "resonance sensations" disappear, which gives the reason to speak about experimental definition of a healthy person as such who does not respond in any way to the external mm-range electromagnetic radiation of extremely low intensity.

As we see, even the first steps of the new sciences – physics of the alive and quantum medicine, based on the comprehension that life is the fourth fundamental level of quantum organization of nature – make it possible to approach the solution of global problems of biology and medicine in a new way. So it is a natural hope that practical medicine would, as soon as possible, take into account the new ideas about the nature of life and implement the available technologies of quantum medicine in order that the declared slogan: Medicine of the third millennium – "Life without pain", would have been realized in the forthcoming ten years.

6. *Philosophical Implications*

To conclude the paper I would like to pay attention to philosophical aspect of the concepts of physics of the alive.

I have underlined more than once that all the living beings are macroscopic quantum-mechanical entities which obey the laws of quantum mechanics (beginning with its principles).

At the same time we get used to treat ourselves and other living beings surrounding us (people, dogs, cats, birds, etc.) as the common macroscopic entities which

obey the laws of classical mechanics. According to these laws we are moving, the forces of gravitation and inertia affect us, in a free state we are positioned with the minimum of the potential energy, our extremities and jaw bones work by the law of levers. Moreover, millions of chemical reactions in a body take place in accordance with the laws of chemical transformations, just those, which can be observed and re-created outside a body. And what is the living organism – the quantum-mechanical entity, the object of classical mechanics, or the extremely complex computer which defines the sequence of chemical transformations, generation of the adequate ingredients, etc.?

The first, the second, and the third, all at once… and something else above it. Under the words "something else above it" I imply "the special point" around which there occur events related to formation of the electromagnetic framework inside a mother's womb. From mathematical viewpoint this corresponds to Poincare solution of nonlinear differential equations as the limit cycles in the phase plane. During the embryo period and further on, during the whole life, there have been developed and sustained synergetic scenarios [45] which are called the dissipative structures hierarchies. And at different intersections of the cognition planes, they characterize the living as a whole quantum entity as well as a complex computerized factory and also as an object of classical mechanics.

"The special point" is and, I am convinced, will always be beyond the cognitive possibilities of science. Mechanical and chemical aspects of life are studied by the existing medical-biological sciences. Physics of the Alive and Quantum Medicine investigate the fundamental quantum-mechanical level of the living.

7. *Conclusion*

I am sure that nobody from mortals could treat anybody. What I can do (with my assistants) is to try to restore the patient electromagnetic frame (coherence eigenfield of the organism), knowing that if it would be successful all the rest the Nature will do by itself.

Apstrakt:

Kvantna fizika Živog bazirana je na definiciji Živog (za razliku od Neživog) kao četvrti nivo kvantne organizacije Prirode. Samo-saglašeni potencijal svakog živog objekta je formiran u skladu sa genomom kao laserom u mm-opsegu talasnih dužina. Takav koncept Živog, baziran na teorijskim razmatranjima, kliničkom materijalu i direktnim eksperimentima, dozvoljava nam da bacimo svež pogled na fundamentalne probleme biologije i ne samo na njih…

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